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AUTHOR Evers, Nancy A.
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ABSTRACT

As part of a symposium intended to present a conceptual framework for networking and to discuss the implications of network usage for education research and practice, this paper presents a review of the leading change strategies and poses a definition of education change network. Education change network is defined as a linkage structure that has been deliberately created to help the user system solve its identified problems. Its form is composed of linkage relationships, and its function is problem-solving by, and for, the user system through effective use of resources accessed via linkage relationships. (Author/MLF)

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"THE EMERGING USE OF NETWORKS IN EDUCATION"

By

Nancy A. Evers, Ph.D.

University of Cincinnati
Department of Educational Leadership
Program of Educational Administration

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As all other arenas of our social system, education is in a milieu of problems. A problematic state has been a condition of existence for education in the past and is a predictable condition of existence for education in the future. These problems are caused by varying degrees of pressure being applied on educational systems. As long as agencies responsible for schooling have internal and external pressures, there will be change. Since change is inevitable, educators have a choice of being reactive to change or proactive in controlling and directing change to improve educational practice. Debate has gone from change versus no change to the methods employed in planned change (Bennis et al. 1976, p.2). Planned change in education is the deliberate and collaborative effort to improve education through the utilization of valid and appropriate knowledge in solving the problems confronting education.

The collaborative aspect of planned change has recently received a great deal of attention as being a significant factor in contributing to the eventual solution of major problems in education. Havelock and other scholars have reported that where there were numerous, person-to-person open channels of communication among individuals and groups there was greater possibility for effective knowledge transfer and feedback which is a pre-condition for institutionalization of change (Havelock, 1973; Mangione, 1970; Brickell, 1961). The building of support systems to address common, critical problems has its roots in basic interpersonal needs. People need people; similarly, groups need groups (Schutz, 1966). This paper will present a brief review of the leading theoretical perspectives on change and pose a definition of education change network.

General systems theory provides a macroview of the dynamic interdependence of intergroup or intersystem relationships. However, there does not exist a single theory of planned educational change (Miles, 1967). There does exist some strategies and processes of change or theoretical perspectives of change which can provide a conceptual framework for the study of

educational change networks. The six major strategies are: (1) social interaction; (2) problem solver; (3) research, development, and diffusion; (4) linkage; (5) organizational development; and (6) proactive/interactive change (Gaddis, 1978).

The social interaction strategy emphasizes the patterns by which innovations diffuse through a social system. In this strategy, the assumption is made that the innovation has already been created, developed, and partially diffused and is awaiting adoption by a user. The social interaction between the potential adopter and his/her reference group is the major source of communication concerning the innovation. The social interaction strategy emanated from the field of rural sociology as a means for implementing new agricultural products. Initial research by Ryan and Gross (1943) on the adoption of hybrid seed corn lead to numerous studies on this strategy. The research findings associated with the social interaction strategy support five generalizations:

(1) that the individual user or adopter belongs to a network of social relations which largely influences his adoption behavior;

(2) that his place in the network (centrality, peripherality, isolation) is a good predictor of his rate of acceptance of new ideas;

(3) that informal personal contact is a vital part of the influence and adoption process;

(4) that group mem ership and reference group identifications are major predictors of individual adoption; and

(5) that the rate of diffusion through a social system follows a predictable S-curve pattern (very slow beginning followed by a period of very rapid diffusion, followed in turn by a long late-adopter or "laggard" period) (Havelock, 1973, p. 159).

The problem solver strategy is based on the assumption that change is a problem-solving process which goes on inside the user or client. The outsider is not usually the initiator of

change but works collaboratively with the client by helping the client through the process and/or providing information. Problem solving is generally viewed as a sequence of client activities of identifying the problem, gathering information, formulating or selecting a solution or innovation, and trying out the innovation in terms of its effectiveness in solving the identified problem. The major advocates and researchers of the problem solving strategy are Lippitt, Watson, and Westley, (1958), Jung (1966) and Thelen (1967). These social psychologists generally stress the following: (1) user need is the paramount consideration of the change agent; (2) diagnosis of need is an integral part of the entire process; (3) the change agent should be nondirective; (4) internal resources should always be fully utilized; and (5) self-initiated and self-applied innovation will have the strongest user commitment and best chances for survival (Havelock, 1973).

The research, development, and diffusion (R,D&D) strategy emphasizes the predetermined solutions to problems and focuses upon closing the gap between theory and practice, instead of focusing on user needs. The research, development, diffusion strategy views change as an orderly process of identifying a problem, developing activities toward finding or producing a solution to the problem, and diffusing a solution to the target group. This strategy assumes the following: research, development, and packaging are before mass dissemination; planning is on a massive basis over a long period of time; there is division and coordination of labor; the user is passive and will accept the innovation; the initial development cost is high (Havelock, 1973). Brickell (1964) and later Clark and Guba (1965) are credited with the most systematic conceptualization of this strategy.

The linkage strategy, conceived and developed by Havelock (1969), incorporates the major features of the three previously discussed strategies and forms an eclectic comprehensive view of change. This strategy centers around the two-way interaction process or linkage between the sources of knowledge and the users

of knowledge. The internal problem solving process of the user is the starting point for the process. In order to link effectively, the outside resource system and the user system must appreciate how the resource system operates. Mutual reinforcement and reciprocal feedback or mutual collaboration evolve between the resource system and the user system. Innovations are then able to pass efficiently and effectively through these linkages. Even though there is currently a lack of empirical and descriptive research to validate the linkage concept and to test the efficacy of linkages, the Havelock linkage strategy holds a great deal of potential for assisting in the successful implementation of innovations in schools.

The organizational development (OD) strategy, largely conceived and developed by Schmuck and others (1972), regards the school as a living system which is goal-oriented and which displays varying degrees of openness and communication. The organizational development is usually directed by outside consultants using planned intervention strategies to train school staff to deal with their own organizational problems. The intervention strategies are disigned to assist the organization in developing potential for adapting to change.

The proactive/interactive change model developed by Zaltman (1977) is a problem solving model which also describes the purposive interaction of the educational system and the environment when there is internally initiated change within the organization. The implementation of change occurs through improved communications linking the system and the environment, utilizing available resources, and lowering the participants' resistance to change. Within this framework, the change agent actively seeks constructive contact with the environmental forces and resources which promotes feedback and allows for recycling at each stage (Gaddis, 1978).

Six strategies or perspectives of change have been presented: social interaction; problem solver; research, development, and diffusion; linkage; organizational development; proactive/interactive change. Of these, Havelock's linkage perspective provides

the conceptual basis for the dynamics of interorganizational relationships in the diffusion of an innovation or the conceptual basis for networking. Critical aspects of each perspective have contributed to the conceptualization of an educational change network.

Based on what we know about change, it is the author's contention that education systems can become more effective in solving problems by deliberately and systematically linking resources and following a problem solving process. The concepts of an education change network hold a great deal of potential for addressing problems confronting education. An educational change network is a linkage structure composed of a resource system, mediating system, and user system which has been deliberately created to help the user system solve its identified problems. To more fully explicate this definition of an educational change network the concepts of linkage, resource system, mediating system, user system, and user system problem solving process will be operationally defined.

Linkage is the spanning of system boundaries and the complex interactions associated with the spanning activities between and among resource, mediating, and user systems. It represents intersystem connectedness, intersystem interaction, or intersystem relationships. The concept of linkage consists of three dimensions. type, mode, and frequency. The type of linkage corresponds to the functions of conveying, consulting, training, etc. The mode of linkage corresponds to the means of interaction, for example face-to-face, telephone, written media, and films. The frequency of linkage corresponds to the rate of linking acts or the number of interactions over a period of time (Paul, 1974, pp. 77-78).

Resource system is the source of a research product or innovation. Within resource system the functions of research and development are conducted systematically to produce new knowledge. The resource system creates new knowledge and is responsible for transferring the knowledge to those systems that can benefit from it (Paul, 1974). Research and development centers and laboratories, universities, and research and

development divisions within school systems have been established to serve this function.

The mediating system serves the functions of (1) amplifying and supplementing the knowledge transference between the resource system and the user system and (2) helping the user system identify its own problems. The interposition of the mediating system results in an augmented diffusion effort and facilitates linkage between the user and resource systems (Paul, 1974). In education, state education agencies (SEA), teacher education institutions (TEI), and intermediate education agencies (IEA) (e.g. county offices or regional service agencies) serve this function.

User system is the recipient and user of the knowledge, research products, and innovations produced and diffused by the resource system (Paul, 1974). The focus of the resource system and the mediating system is producing and transferring resources to the user system which has identified its problems; therefore, the combined energies of the network focus on the user system's problems. In education, local education agencies (LEA) and TEI or educational institutions which provide instruction most often serve this function.

User system problem solving process has been described as: recognizing and defining needs; diagnosing problems and setting objectives; acquiring relevant resources; selecting or creating solutions; adapting and installing solutions; and evaluating solutions. Because the user system or client may be involved with its own problem(s), it can be helped greatly by the change agent behavior of process helper (Havelock, 1973). The process helper role may be assumed by personnel within the user system or outside of the user system. Due to its position in the network and its function, the mediating system could perform the process helping role. The problem solving process helper role is based on the assumption that change will take place with more ease resulting in greater efficacy. The necessity of the process helping function has yet to be empirically validated; however, it seems likely that the application of tested problem solving process skills would significantly

influence networking.

Havelock (1973) has articulated the process helper role in six interrelated stages. 1. Building a relationship -- the process helper needs to establish a viable relationship with the user system. 2. Diagnosis -- the process helper assists the user system articulate its need and transform it into a problem. 3. Acquiring relevant resources -- the process helper assists the user system in an information search and serves as a link to information resources. 4. Choosing the solution -- the process helper assists the user system through the sequential steps of deriving implications from research, generating a range of solution ideas, feasibility testing, and adaption. 5. Gaining acceptance -- working with the user system, the process helper moves the selected solution toward acceptance by the widest possible number of individuals in the user system by helping them gain awareness, develop interest, evaluate, try out, and finally adopt the solution. 6. Stabilization and self-renewal -- the process helper encourages members of the user system to be their own process helper and develop an internal capability to maintain the solution.

A change network has form and function. Its form is composed of linkage relationships among the resource system, mediating system, and user system. The nature of those relationships must be mutually supportive or interdependent. There is a danger that one system may become dependent upon another. To avoid that danger all systems must have ownership on the user system's problems and have a commitment to solving the problems. In addition, the nature of the relationships must include legitimacy. The sharing of resources among systems needs to be open, and is facilitated through the normative support of each system.

The function of a change network is problem solving by and for the user system through effective use of resources which have been accessed through linkage relationship. An education change network, then, is composed of linkages among

those agencies which produce validated knowledge regarding education, those agencies which facilitate the flow of that knowledge to a user education agency, and those education agencies which use the validated knowledge. The function of an education change network is the solving of problems confronting education by schooling institutions through using resources generated by education agencies producing validated knowledge. In other words, the focus of change is the user system; its needs and problems must be the primary concern of educational reform.

Education has been frustrated by its inability to organize and apply its resources to the solving of critical problems. The inability to form collaborative relationships has been partially stimulated through competition for scarce resources. Research findings reported by Hammond and Goldman (1971) indicate that non-competition is more favorable for group process than either group or individual competition and that working as a group is more conducive to quality of the finished product than working as individuals. Scarce dollars for educational research, development, and diffusion have been made available in the past on a competitive basis. It is heartening to note that there seems to be a growing trend on the part of governmental agencies to award dollars for collaborative efforts and in some cases, make dollars available specifically for developing collaborative arrangements and for conducting research on linkage relationships. In particular, the National Institute of Education is to be congratulated on initiating and supporting efforts regarding education change networks. The two network programs being described in this session are excellent examples of education change networks. They hold significant potential for solving critical problems in education today and stimulate the hope for continuous growth.

There is a great deal of conceptualization and research which has yet to be done in order to realize the goal of full resource utilization in solving education problems. We are at the threshold of making some significant strides forward in our understanding of networking and how best to operationalize the concept.

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